

# Memorandum

## Environment and Resources



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**From** Michael Fisher, Miranda Marks

**Subject** Financial Impact of Assisted Recirculation Technology on Entergy Wholesale Commodities and Pilgrim Nuclear Power Station

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We assessed the impact of 316(b) regulatory compliance by assisted recirculation at Pilgrim Nuclear Power Station (PNPS) on the financial performance of Entergy Wholesale Commodities (EWC) business unit and PNPS.

### 1 Summary of Analysis

1. Used EWC income statement for fiscal year 2014 (year ended December 31, 2014)<sup>1</sup> as the baseline income statement for this analysis.
2. Estimated PNPS income statement from EWC statement based on PNPS fraction of total EWC nuclear generation.
  - This assumes that EWC's revenue and cost structure is uniform over EWC's power plants, and the PNPS income statement would be a simple proportional flow-down of the EWC income statement.
3. To assess the impact of compliance technology costs on EWC's and PNPS's income statements, we adjusted the relevant EWC and PNPS income statement account items using the technology cost and operating effect values from the Cost Analysis Calculator's private cost analysis. As examples, we applied the energy effect-based loss in revenue to the revenue account, technology operating costs to the operating cost acct, and construction cost-based depreciation to the depreciation account. These adjustments yield EWC and PNPS income statements that reflect the cost and operating effects of assisted recirculation technology.
4. In developing these income statements, we made a few adjustments to the cost and operating effect values that otherwise would be drawn directly from EPA Region 1's current analysis of compliance technology for PNPS.
  - In the Calculator's private cost analysis, all cost factors except depreciation change over time with either general or factor-specific inflation. As a result, because the PNPS cost analysis assumes that compliance technology begins operating in 2020, the future cost values taken from the Calculator would incorporate inflation, and would be temporally inconsistent with the EWC and PNPS income statement values from 2014. Because of the potentially substantial inflation-based increases in these future cost values, the misalignment of the Calculator's cost values with the 2014 income statement values would overstate the impact of technology installation and operation on EWC and PNPS financial performance. To avoid this problem, in our analysis, we used technology cost values as of 2014 – i.e., before

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<sup>1</sup> From *Entergy Investor News*, Entergy Reports Fourth Quarter and Full Year Earnings, Initiates 2015 Operational Earnings Guidance, Feb. 5, 2015.

adjusting for inflation to the actual periods of cost incurrence – so that we could align these values with the 2014 income statement values.

- We also updated the U.S. Treasury security-based reference rates that underlie the Calculator's cost of financial capital values (interest rates for debt financing and expected return for equity financing). This updating caused the cost of financial capital values to be modestly lower than the values previously used in EPA Region 1's cost analysis.
  - We imputed an interest charge for financing compliance technology outlays based on the current EWC financial structure, and using the estimated debt cost values developed in the Calculator. The estimated interest charge assumes 30-year financing of the debt component of compliance technology outlay. This estimated interest value, which is applied to EWC's and PNPS's income statements, is the *only* cost item not currently present in the Calculator's cost impact and cash flow analysis. The estimated interest value is relevant for estimating income statement effects, but not for estimating annualized cash flow effects, which is the Calculator's current concept for assessing cost and financial impact.
5. The adjusted income statements show the impact of compliance technology cost and operating effects on the EWC and PNPS income statements. *Table 1* and *Table 2*, following pages, summarize these effects for the first and fifth years of technology operation. The tables report the absolute and percentage effects for selected financial performance measures in the income statement: revenue, gross margin, operating income, pre-tax income, and net income.
  6. In addition to calculating effects on the income statement-based measures, we also estimated effects on after-tax cash flow, which is a better measure of potential impact on EWC and PNPS business value. We first calculated the change in *operating* cash flow, and then added to this value the reduction in cash flow on an annualized cost-basis for financing the technology capital outlay. The resulting values are reported in the bottom row of *Table 1* and *Table 2*.

## 2 Findings

1. The resulting estimated changes in financial performance at the level of the EWC business segment are comparatively minor, ranging from a 0.3 percent reduction in revenue, to an 8.6 percent reduction in pre-tax operating income in the fifth year of operation. The estimated reduction in net income (GAAP profitability) is 4.9 percent reduction in year 1 and 6.6 percent reduction in year 5.<sup>2</sup> The estimated reductions in after-tax cash flow are modestly less: 3.7 percent in the year 1 and 3.1 percent reduction in the year 5.
2. At the level of PNPS, the changes are more substantial, ranging from a 1.9 percent reduction in revenue, to a 60.1 percent reduction in pre-tax operating income in the fifth year of operation. The estimated reduction in net income is 34.1 percent reduction in year 1 and 45.8 percent reduction in year 5. The estimated reductions in after-tax cash flow, while still substantial, are considerably less: 26.1 percent in the year 1 and 21.4 percent reduction in the year 5.
3. Although the estimated reductions in key financial metrics are material, they do not reach the level that would jeopardize EWC or PNPS financial viability. Given the substantial capital outlay for the compliance technology, it is reasonable to expect this level of financial impact.

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<sup>2</sup> The change from year 1 to year 5 net income results from the tax depreciation schedule. In subsequent years, the reduction in net income would be less than calculated for year 5.

**Table 1: Entergy Wholesale Commodities, Income Statement (FY 2014, year ended Dec. 31, 2014), with 316(b) Permit Cost Adjustments***all dollar values in \$ 000*

	Pre-Cmpl	Operating Year 1			Operating Year 5		
		Cmpl Adj	Post-Cmpl	% Change	Cmpl Adj	Post-Cmpl	% Change
<b>Total Operating Revenue</b>	\$2,719,404	\$(7,412)	\$2,711,992	-0.3%	\$(7,412)	\$2,711,992	-0.3%
<b>Operating Expenses</b>							
<u>Operating and Maintenance (Cost of Production)</u>							
Fuel, fuel related expenses, and gas purchased for resale	\$413,087	-	\$413,087	0.0%	-	\$413,087	0.0%
Purchased Power	\$82,105	-	\$82,105	0.0%	-	\$82,105	0.0%
Nuclear refueling and outage expenses	\$149,321	-	\$149,321	0.0%	-	\$149,321	0.0%
Other operation and maintenance	\$1,023,018	\$1,050	\$1,024,068	0.1%	\$1,050	\$1,024,068	0.1%
<b>Total Operating and Maintenance (Cost of Production)</b>	\$1,667,531	\$1,050	\$1,668,581	0.1%	\$1,050	\$1,668,581	0.1%
<b>Revenue Less Cost of Production (Gross Margin)</b>	\$1,051,873	\$(8,462)	\$1,043,411	-0.8%	\$(8,462)	\$1,043,411	-0.8%
<u>Other Expenses (Sales, General and Administrative)</u>							
Asset write-offs, impairments, and related charges	\$107,527	-	\$107,527	0.0%	-	\$107,527	0.0%
Decommissioning	\$141,511	-	\$141,511	0.0%	-	\$141,511	0.0%
Taxes other than income taxes	\$130,729	-	\$130,729	0.0%	-	\$130,729	0.0%
Depreciation and amortization	\$275,924	\$16,838	\$292,762	6.1%	\$25,646	\$301,570	9.3%
<b>Total Other Expenses (Sales, General and Administrative)</b>	\$655,691	\$16,838	\$672,529	2.6%	\$25,646	\$681,337	3.9%
<b>Operating Income (Gross Margin less SG&amp;A)</b>	\$396,182	\$(25,300)	\$370,882	-6.4%	\$(34,108)	\$362,074	-8.6%
<b>Other Income (Deductions)</b>							
Interest and investment income	\$113,959	-	\$113,959	0.0%	-	\$113,959	0.0%
Miscellaneous - net	\$(21,986)	-	\$(21,986)	0.0%	-	\$(21,986)	0.0%
<b>Total, Other Income (Deductions)</b>	\$91,973	-	\$91,973	0.0%	-	\$91,973	0.0%
<b>Interest Expense</b>	\$16,646	\$369	\$17,015	2.2%	\$369	\$17,015	2.2%
<b>Income before Income Taxes</b>	\$471,509	\$(25,669)	\$445,840	-5.4%	\$(34,477)	\$437,032	-7.3%
<b>Income Tax</b>	\$176,988	\$(11,264)	\$165,724	-6.4%	\$(15,129)	\$161,859	-8.5%
<b>Net Income</b>	\$294,521	\$(14,406)	\$280,115	-4.9%	\$(19,349)	\$275,172	-6.6%
<b>After-Tax Operating Cash Flow - Not Including Capital Outlay</b>	\$570,445	\$2,432	\$572,877	0.4%	\$6,297	\$576,742	1.1%
<b>Annualized Capital Outlay</b>		\$(23,754)			\$(23,754)		
<b>After-Tax Cash Flow - Including Annualized Capital Outlay</b>	\$570,445	\$(21,322)	\$549,123	-3.7%	\$(17,457)	\$552,988	-3.1%

**Table 2: PNPS Estimated Income Statement (FY 2014, year ended Dec. 31, 2014), with 316(b) Permit Cost Adjustments***all dollar values in \$ 000, PNPS estimates based on PNPS fraction of total EWC nuclear capacity-based generation*

	Pre-Cmpl	Operating Year 1			Operating Year 5		
		Cmpl Adjs	Post-Cmpl	% Change	Cmpl Adjs	Post-Cmpl	% Change
<b>Total Operating Revenue</b>	\$389,751	\$(7,412)	\$382,339	-1.9%	\$(7,412)	\$382,339	-1.9%
<b>Operating Expenses</b>							
<u>Operating and Maintenance (Cost of Production)</u>							
Fuel, fuel related expenses, and gas purchased for resale	\$59,205	-	\$59,205	0.0%	-	\$59,205	0.0%
Purchased Power	\$11,767	-	\$11,767	0.0%	-	\$11,767	0.0%
Nuclear refueling and outage expenses	\$21,401	-	\$21,401	0.0%	-	\$21,401	0.0%
Other operation and maintenance	\$146,621	\$1,050	\$147,671	0.7%	\$1,050	\$147,671	0.7%
<b>Total Operating and Maintenance (Cost of Production)</b>	\$238,994	\$1,050	\$240,045	0.4%	\$1,050	\$240,045	0.4%
<b>Revenue Less Cost of Production (Gross Margin)</b>	\$150,757	\$(8,462)	\$142,295	-5.6%	\$(8,462)	\$142,295	-5.6%
<u>Other Expenses (Sales, General and Administrative)</u>							
Asset write-offs, impairments, and related charges	\$15,411	-	\$15,411	0.0%	-	\$15,411	0.0%
Decommissioning	\$20,282	-	\$20,282	0.0%	-	\$20,282	0.0%
Taxes other than income taxes	\$18,736	-	\$18,736	0.0%	-	\$18,736	0.0%
Depreciation and amortization	\$39,546	\$16,838	\$56,384	42.6%	\$25,646	\$65,192	64.9%
<b>Total Other Expenses (Sales, General and Administrative)</b>	\$93,975	\$16,838	\$110,813	17.9%	\$25,646	\$119,621	27.3%
<b>Operating Income (Gross Margin less SG&amp;A)</b>	\$56,782	\$(25,300)	\$31,481	-44.6%	\$(34,108)	\$22,674	-60.1%
<b>Other Income (Deductions)</b>							
Interest and investment income	\$16,333	-	\$16,333	0.0%	-	\$16,333	0.0%
Miscellaneous - net	\$(3,151)	-	\$(3,151)	0.0%	-	\$(3,151)	0.0%
<b>Total, Other Income (Deductions)</b>	\$13,182	-	\$13,182	0.0%	-	\$13,182	0.0%
<b>Interest Expense</b>	\$2,386	\$369	\$2,755	15.5%	\$369	\$2,755	15.5%
<b>Income before Income Taxes</b>	\$67,578	\$(25,669)	\$41,908	-38.0%	\$(34,477)	\$33,101	-51.0%
<b>Income Tax</b>	\$25,366	\$(11,264)	\$14,103	-44.4%	\$(15,129)	\$10,238	-59.6%
<b>Net Income</b>	\$42,211	\$(14,406)	\$27,806	-34.1%	\$(19,349)	\$22,863	-45.8%
<b>After-Tax Operating Cash Flow - Not Including Capital Outlay</b>	\$81,758	\$2,432	\$84,190	3.0%	\$6,297	\$88,055	7.7%
<b>Annualized Capital Outlay</b>		\$(23,754)			\$(23,754)		
<b>After-Tax Cash Flow - Including Annualized Capital Outlay</b>	\$81,758	\$(21,322)	\$60,436	-26.1%	\$(17,457)	\$64,300	-21.4%